FROM THE FUNDAMENTAL EQUATIONS TO EFFECTIVE DEMAND: ‘NATURAL EVOLUTION’ OR ‘CHANGE OF VIEW’?

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1. Premise

One of the difficult tasks, which any scholar of Keynes’s writings is confronted with, is that of tracing the relationship between the General Theory and the Treatise. To this controversial matter, which has spawned a large literature, I would like to contribute with a further element which does not seem to have received as much attention as others, namely an investigation into Keynes’s own assessment of the relationship between his two books.

Keynes was convinced that there was a fundamental continuity between the Treatise and the General Theory. Throughout the process which led him from the former to the latter book, he repeatedly claimed that the Treatise analysis was in fact compatible with that of the General Theory and that he had made the new argument only ‘much more accurate and instructive’ (Keynes 1936 [1973b]: 77).

In fact, the transition from the Treatise analysis, as presented in the Fundamental Equations and that of the General Theory, as incorporated in the principle of effective demand, required the introduction of new concepts and a change in definitions, which eventually made the latter approach quite distinct from the former. However, Keynes wanted his readers to believe that ‘under the surface [...] the essential ideas are the same’ (Skidelsky 1992: 442), and presented his new book as a ‘natural evolution’ in his line of thought. (Keynes 1936 [1973b]: xxii).

In this paper I follow this evolution step by step, comparing Keynes’s own measurement of the distance from his previous framework of analysis with our present understanding of the change involved in the process of building up the new one. To spin the narrative, I divide the five years spanning from the publication of the Treatise to that of the General Theory into three time-legs, which I have marked as Stages I, II and III. The first dates from comments and criticism
on the *Treatise* (autumn 1930) to the early material for the new book and lectures (spring 1932). Stage II spans from the Easter Term 1932 lectures, which were attended by members of the 'Circus', to the summer 1933, when the writing of the new book was well under way. The final stage runs from the 1933 Michaelmas Term lectures and the contemporary fragments of versions of the *General Theory*, when the principle of effective demand was clearly expounded, to the final touches to the proofs in December 1935.

2. **Stage I: Autumn 1930–Spring 1932**

It will be remembered that in the *Treatise* the equilibrium condition of the overall system is given by the equality of the value of investment (\(I\)) to its cost of production (\(I'\)) and by the equality of the value of investment to saving (\(S\)). This corresponds to a situation of zero extra profits in the consumption (\(Q_1\)) and investment sectors (\(Q_2\)), and to equality of investment to saving. Total profits (\(Q\)) are then the equilibrating mechanism not only between cost of production and the value of output, but also between saving and investment (Keynes 1930 [1971]: 124):

\[
Q_1 = I' - S.
\]

\[
Q_2 = I - I'.
\]

\[
Q = Q_1 + Q_2 = I - S.
\]

There are different effects on the system, according to how profits are spent. In the 'widow's cruse' example (Keynes 1930 [1971]: 125), if entrepreneurs spend their extra profits on consumption goods, the positive gap between the cost of investment goods and saving widens: the price of consumption continues to increase, and so do profits. When profits are positive, entrepreneurs have an incentive to increase output and employment; if losses occur, both output and employment will be reduced. However, adjustment of output is not the object of the analysis in question, although in the 'banana plantation' example (Keynes 1930 [1971]: 158ff.) the effect of losses (due to an autonomous increase in saving) on output is taken up to show the potential instability of the system (Barens 1987). If, starting from an equilibrium condition (prices = costs of production, saving = investment), there is an increase in saving, the price of consumption goods fall, entrepreneurs incur losses and so cut back on employment. A new equilibrium position is reached only when either: (a) output is reduced to zero; (b) the reduction in saving no longer occurs; and (c) investment increases and exceeds saving (Keynes 1930 [1971]: 160). The possibility that equilibrium is reached at a positive level of output was not envisaged.

The Fundamental Equations apparatus was the object of criticism from the outset. Hawtrey, Robertson, Pigou and Kahn objected to some of Keynes's definitions

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and conclusions. In particular, three issues came to the forefront: (a) the ‘independence’ of the forces underlying determination of the two price levels; (b) the definition of saving; and (c) the price–output adjustment mechanism.

As a result of the various criticisms, a few months after publication of the *Treatise*, Keynes recast his argument in a new form. The first evidence of a change in formulation is the account which he gave in the Harris Foundation lectures (June 1931) of the reason for expecting a positive equilibrium level of output to be reached:

A given deficiency of investment causes a given decline of profit. A given decline of profit causes a given decline of output. Unless there is a constantly increasing deficiency of investment, there is eventually reached, therefore, a sufficiently low level of output which represents a kind of spurious equilibrium.

(Keynes 1973a: 356)

Unlike the ‘banana plantation’ example, the possibility that the equilibrium level of output may be less than zero is now given, on the basis of the assumed behaviour of saving: ‘[...] as soon as output has declined heavily, strong forces will be brought into play in the direction of reducing the net volume of saving’ (Keynes 1973a: 356). This result was anticipated in a letter to Kahn of 17 April 1931 (during the ‘Circus’ period): ‘[...] when O [output] is falling, unless entrepreneurs’ expenditure on consumption falls faster than O, there is a reduction of saving’ (Keynes 1979: 12). What, however, remained to be determined was at which level of profit entrepreneurs are no longer inclined to continue production, or, on the other hand, have an incentive to expand production. The solution was found in a new relationship, which Keynes attributed to Kahn (Keynes 1973a: 368), the aggregate supply curve.¹

During the summer of 1931, Keynes worked to pin down cases where ‘points of equilibrium output can be reached which fall short of maximum and zero’ (Keynes 1973a: 374). The mechanism he submitted to Kahn in a letter of 20 September 1931 may be outlined thus: an increase in investment (I) raises profits (Q), part of the increase in profits going into savings (S); at the same time, an increase in profits raises output (O), along the aggregate supply curve, and thus brings about a further increase in savings. However, the profit per unit of output (Q/O) declines as output increases since profits fall as savings rise. Keynes’s conclusion was that ‘If Q/O reaches zero before O reaches maximum, we have “long-period unemployment”, i.e. an equilibrium position short of full employment.’ (Keynes 1973a: 374).

Kahn was not totally convinced (Keynes 1973a: 375); it was clear that the question was far from being settled. Keynes had to work out the new formulation afresh, which is what he set out to do in the autumn of 1931. He told Lydia on 22 November: ‘I have begun again quietly in my chair writing about monetary theory’ (Skidelsky 1992: 432). In fact, early in 1932, in a draft,² he was able to
present the 'vital generalisation' of the proposition that entrepreneurs tend to increase or decrease their output according as their profit is increasing or decreasing, which runs as follows:

[...] increases and decreases in the volume of output and employment depend upon the changes in disbursement relative to earnings (which is the alternative mode of expression I now offer to the reader) or in investment relatively to savings (which is the mode of expression I employed in my Treatise on Money).

(Keynes 1973a: 380)

The condition for equilibrium was specified accordingly:

[...] provided $\Delta S$ [changes in saving] and $\Delta E$ [changes in earnings] have the same sign, and that investment does not change, any level of output is a position of stable equilibrium. For any increase of output will bring in a retarding factor, since $\Delta S$ will be positive and consequently $I$ being assumed constant, $\Delta Q$ will be negative; whilst equally any decrease of output will bring in a stimulating factor, since $\Delta S$ will be negative and consequently $\Delta Q$ positive.

(Keynes 1973a: 386–7)

Summing up, in Stage I Keynes inherited a framework of analysis based on the Fundamental Equations, in which profits were the 'main spring of change', through variations in the price levels of consumption and investment goods. As a consequence of much criticism within the 'Circus' and by Hawtrey, Robertson, and Pigou, with the main focus on the supposed independence in determination of the two price levels and the neglect of output as opposed to price adjustment, Keynes was led to forge new tools. In the Harris Foundation lectures we find the first 'hints' (Keynes 1973: 79) of a move towards a different approach. During the summer of 1931 and until he resumed lecturing in April–May 1932, he searched for the conditions for an equilibrium of output to occur, at less than full employment. His solution rested on what he believed to be only a 'generalisation' of the old argument, but which was instead a switch of focus: from investment-relative-to-saving to expenditure-relative-to-income.5

3. Stage II: Easter Term 1932–summer 1933

When Keynes resumed† lecturing in April–May 1932‡ he presented his new argument as a 'generalisation' of that of the Treatise.§

[...] fluctuations of output and employment for a given community over the short period [...] depend almost entirely on the amount of current investment. This goes beyond the contention of my Treatise, where
it was meant to depend on the amount of investment relatively to saving [...]. This less restricted generalisation is the result of taking account of the probable effect on saving of a change in the amount of investment.

(Keynes 1979: 41)

This result was reached on the 'presumption' (Keynes 1979: 41) that changes in saving, following a change in investment, rather than offset, reinforce the effects of the change in investment on profit and output. The main argument was that changes in investment and output were positively correlated: an increase in output is equal to an increase in sales receipts (= income); an increase in investment is equal to an increase in sales receipts (= income) minus expenditure on consumption; consumption and income are positively correlated, therefore changes in investment and changes in output have the same sign. This 'proof' was challenged by Kahn, Austin and Joan Robinson who signed a Manifesto and offered an 'alternative' (as Keynes put it) or 'complementary' (as Joan Robinson had it in her subsequent correspondence) solution (Keynes 1973a: 378). The authors of the Manifesto claimed that demonstration would be better handled 'by the method of supply and demand' (Keynes 1979: 43). The increase in investment - they argued - leads directly to an increase in the level of output because it raises the demand for consumption goods; assuming as given the supply conditions of these goods, the new level of output of consumption goods and thus the aggregate level of output can immediately be determined.

Keynes was reluctant 'to scrap all my present half forged weapons' (Keynes 1973a: 378), as he wrote to Joan Robinson, but shortly afterwards he gave in. In the lectures of Michaelmas Term 1932, when he changed the title of his course to 'The Monetary Theory of Production', he took up the 'method' of the Manifesto. However, once again he pledged that 'a change in demand as a whole relatively to supply as a whole due to deficient disbursement [...] is the same thing as what in my Treatise on Money, I have called an excess of saving over investment' (Keynes 1979: 53).

In those lectures, windfall profits are the signals which induce entrepreneurs to revise their production decisions, but whether or not entrepreneurs are making profits is now made dependent on whether disbursements (i.e. expenditure) are greater than earnings. According to his new terminology (Rymes 1989: 57), unlike the Treatise, total income, $E'$, includes profits, being defined as

$$E' = E + Q,$$

while $E$ retains its old meaning of earnings. Moreover, the 'new term' (Rymes 1889: 57) disbursement, $D$, is defined as the sum of investment, $I$, and expenditure on consumables, $F$, which are made equal to income. Then we have

$$D = I + F = E' = E + Q$$
and
\[ Q = I - (E - F), \]
hence
\[ Q = I - S. \]

Parallel to the change in the definition of income, a new concept of saving was introduced, which Keynes labelled ‘surplus’, retaining \( S = E - F \) for saving:
\[ S' = S + Q. \]

Equality is said always to exist between investment and surplus, the adjustment mechanism being provided by the price of consumables (Rymes 1989: 62); saving being here described as ‘something that has to occur to make more investment possible at the existing price level’ (Rymes 1989: 61).

The ambiguity of Keynes's position at the time – his formulation being halfway between the Treatise and the General Theory – is well revealed by the following passage from a fragment from which he appears to have lectured on 14 November 1932:

[...] if, starting from a position of equilibrium with saving and investment equal, the price level stable and the factors of production fully employed, there occurs a change which causes the rate of interest existing at the moment to become such as to cause saving to be in excess of investment at prices will fall, rates of earnings will fall, and output will fall, in accordance with the argument in my Treatise of Money.

(Keynes 1979: 56)

Certainly, unlike the Treatise, we have here a mechanism preventing output (and/or prices) to be falling to zero or infinity: 'neither prices nor output will fall forever; and they will [...] come to rest again at some position from which they will have no further tendency to depart' (Keynes 1979: 57). The mechanism is provided by the assumption that expenditure always increases less or decreases more than does income ('whenever there is a change in income, there will be a change in expenditure the same in direction but less in amount': Keynes 1979: 38). However, saving is not yet fully integrated as dependent variable in the output-adjusting mechanism.

Early in 1933, the changed political climate prompted Keynes to write four articles for 'The Times' (published between 13 and 16 March 1933) to give his new approach an airing and to relaunch a plan for public spending. These articles were subsequently published as a pamphlet, The Means to Prosperity. A further contribution came with the article The Multiplier (where the term, later to become familiar, made its first public appearance) published in 'The New Statesman' of 1 April 1933.
Moggridge is persuaded – unlike Patinkin (1976) – that by the time of this article the ‘penny had firmly dropped for the theory of effective demand’ (Moggridge 1992: 564). Certainly, a visible leap forward from the Treatise was accomplished in Stage II, with the crucial discovery of the income–expenditure approach, which provided the framework where the multiplier could be fully accommodated.10

As late as 17 August 1933 writing to Macmillan Keynes appeared to think that he could revise the Treatise accordingly, believing that he was just putting off revising it ‘until my next book has appeared’ (Keynes 1973a: 420). As we know, the revision was not to be and perhaps could never have been.

4. Stage III: Michaelmas Term 1933–December 1935

On the basis of the evidence of the lectures of Michaelmas Term 1933, and the contemporary11 fragments of versions of the General Theory that came to light in Tilton’s ‘laundry hamper’, most commentators (Dimand 1988: 167; Moggridge 1992: 562; Patinkin 1976: 79; 1982: 33; 1993: 656) agree that by that time the conception of effective demand had been accomplished.

In ‘an early typed and hand-written draft of what eventually became chapter 5 of the second 1933 draft table of contents’ (Keynes 1979: 68), Keynes presented again ‘our fundamental equations’: the only changes of notation (from the lectures in the previous year) are $C$ for $F$, consumption expenditure, while $I$, income, makes its first appearance:

$$Y = E + Q = C + I = D$$

or

$$Q = D - E = I - (E - C).$$

Facing once again the task of accounting for the change in the definition of saving from the Treatise, Keynes presented the following:

$$S = Y - C = E + Q - C,$$

and then explained that he had decided to retain the notation, $S$, and the word Saving for $Y - C$ and to define $S'$, corresponding to the definition of saving in the Treatise, as Economising (Keynes 1979: 69). He then rewrote the price equations of the Treatise, insisting that, although the definitions were not identical with those given in the previous book, ‘they deal with substantially the same concepts which I was then driving at’ (Keynes 1979: 72).

We have now two definitions of savings ($S$ and $S'$) and two corresponding definitions of profits ($Q$ and $Q'$) to distinguish their meaning from that in the Treatise, according to the following expression:

$$S' = E + Q' - C.$$
He stressed the compatibility of his present treatment with the *Treatise*, by saying that $Q'$ was the ‘flow of quasi-rent relevant to long-period expectations’, while $Q$ is relevant for the short period (Rymes 1989: 107; Keynes 1979: 72).

The Fundamental Equations had by now (Rymes 1989: 110) become

$$Y = E + Q = C + I = D,$$
$$S = E + Q - C = Y - C,$$
$$\Delta S = \Delta Q + \Delta (E - C) = \Delta I,$$
$$\Delta S' = \Delta (E - C),$$

hence

$$\Delta Q = \Delta S - \Delta S'$$

and

$$\Delta Q = \Delta I - \Delta S'.$$

When $\Delta Q$ is positive, because investment is increasing faster than the community is economising (Rymes 1989: 111), firms increase output. To be noted is that in this formulation the role of profits has changed, since now the level of output is dependent on a prospective rather than actual magnitude. In fact, in the fragment corresponding to the first 1933 draft table of contents, Keynes wrote that the level of output depended ‘on the amount by which the sale proceeds of output as a whole are expected to exceed their variable cost’ (Keynes 1979: 64); in other words the relevant magnitude had become *ex ante* or expected profits and not the *ex post* or realised profits, as in the *Treatise*. Eventually, in the fragment of the version of chapter 3 corresponding to the last index of 1933 (December), he made quite clear that the introduction of the principle of effective demand represented the novelty in the *General Theory* treatment:

> In my *Treatise on Money* the equality of saving and investment, as then defined, was a condition equivalent to the equality of aggregate expenditure and aggregate costs, but I failed to point out that this by itself provided only for neutral equilibrium and not for an optimum equilibrium.

(Keynes 1979: 91–2)

In March 1934 Keynes was convinced that the book was by then ‘nearing completion’ (Keynes 1973a: 422). From this period we have the versions of chapters 6–12 of the index to the book, which now bore the title *The General Theory of*
Employment, Interest and Money, written before his journey to the United States in June 1934, and the provisional versions of chapters 8–9 written over the summer. In those drafts he insisted on compatibility with the Treatise analysis, by referring to entrepreneur’s windfall profits or losses as the difference between effective demand and income (Keynes 1973a: 425) and explaining the change in the definitions of income and saving as ‘a change of terminology and not a change of view’ (Keynes 1973a: 476).

The issue of explaining the relationship between the new book and the old one arose again. On 29 November 1934, he wrote to a Spanish correspondent, Luc Beltram:

[...] in a work of mine which will probably come out in about a year’s time I deal with the underlying theory on what at any rate on the surface, would appear to be lines rather different from those adopted in my Treatise on Money. Under the surface, however, the essential ideas are the same.

(Skidelsky 1992: 442)

The General Theory was finished in late December 1935. In the final version Keynes carefully indicated where his new argument departed from the old. First, there was the change in the definition of income:

[...] I should at once remind the reader that in my Treatise on Money I defined income in a special sense. The peculiarity in my former definition related to that part of aggregate income which accrues to the entrepreneurs, since I took neither the profit (whether gross or net) actually realised from their current operations nor the profit which they expected when they decided to undertake their current operations, but in some sense (not, as I now think, sufficiently defined if we allow for the possibility of changes in the scale of output) a normal or equilibrium profit; with the result that on this definition saving exceeded investment by the amount of the excess of normal profit over the actual profit.

(Keynes 1936 [1973b]: 61)

Second, there was a new mechanism for output adjustment:

[...] by an excess of saving over investment I meant [i.e. in The Treatise] that the scale of output was such that entrepreneurs were earning a less than normal profit from their ownership of the capital equipment; and by an increased excess of saving over investment I meant that a decline was taking place in the actual profits, so that they would be under a motive to contract output.

As I now think, the volume of employment (and consequently of output and real income) is fixed by the entrepreneur under the motive of
seeking to maximise his present and prospective profits [...] ; whilst the volume of employment which will maximise his profit depends on the aggregate demand function given by his expectations of the sum of the proceeds resulting from consumption and investment respectively on various hypotheses.

(Keynes 1936 [1973b]: 77)

Third, there was determination of the equilibrium level of output at less than full employment:

In my *Treatise on Money* the concept of changes in the excess of investment over saving, as there defined, was a way of handling changes in profit, though I did not in that book distinguish clearly between expected and realised results. I there argued that a change in the excess of investment over saving was the motive force governing change in the volume of output. Thus the new argument, though (as I now think) much more accurate and instructive, is essentially a development of the old.

(Keynes 1936 [1973b]: 77–8)

Summing up, reinterpreting in Stage III his former approach based on the Fundamental Equations in the light of the latter, based on Effective Demand, Keynes claimed to have established compatibility between the two. The 'expected increase of investment relatively to saving' as defined in the *Treatise* had become 'a criterion of an increase in effective demand' (Keynes 1936 [1973b]: 78). So he felt confident to present the escape from his 'old ideas' as continuity in his line of thought, granting that the exposition in the *Treatise* was 'of course, very confusing and incomplete in the light of the further developments here set forth' (Keynes 1936 [1973b]: 78).

5. Conclusion

Throughout the writing of the *General Theory*, Keynes was at pains to make the new approach compatible with the *Treatise*. First, he presented the argument, reached probably at the end of 1931, according to which changes in the volume of output and employment 'depend upon the changes in disbursement relative to earnings' as a 'generalisation' of the old argument, where it was dependent upon changes in investment relative to saving. Second, during the second half of 1932, in adopting the new 'method' – a fall in output and employment depended on 'a change in demand as a whole relatively to supply as a whole due to deficient disbursement' – he presented it as 'the same thing' as an excess of saving over investment. Third, when in the autumn of 1933 he introduced effective demand and showed that equality of aggregate expenditure to aggregate costs may well occur at a level of output below full employment, he very cursorily mentioned that in the *Treatise* he just 'failed to point [this] out'.
Keynes managed to present his former approach as compatible with the latter by: (a) reinterpreting profits of the *Treatise* 'as determining the current expectation of profit'; and (b) presenting a change in the excess investment over saving of the *Treatise* as 'a criterion' of an increase in effective demand. However, he must have had doubts that his attempted reconciliation was entirely successful, since he wrote in the Preface to the *General Theory*:

> what in my own mind is a natural evolution in a line of thought which I have been pursuing for several years, may sometimes strike the reader as a confusing change of view.

(Keynes 1936 [1973b]: xxii)

The scope for the history of economic thought is to review existing records and textual evidence in order to provide evidence for interpretations and to explain developments of ideas. Unfortunately, the evidence is rarely unambiguous and interpretations are often the by-product of the purpose for which the historical investigation is undertaken. It thus happens that those aiming to discover compatibility among theories conceived at different times tend to draw a line of continuity, whereas those who are mindful of the time at which they were presented are likely to emphasise changes and discontinuities. In the quest for further clues, it may sometimes be attempted to make use of the narrative of the development of ideas given by the author. In this context, I think I agree with what one of Keynes's biographers wrote: 'I believe that one should accept Keynes's retrospective account of how he came to his conclusions.' (Moggridge 1992: 559). However in assessing those conclusions, I cannot but interpret the approach based on effective demand as a 'dramatic' change of view.

**Notes**

1 'You have over a short period something of the nature of a supply curve which tells you that for a given level of prime profit [i.e. the difference between gross receipts and prime costs] there will be a given level of output, that if you have a certain amount of prime profit, that would be sufficient to bring a certain quantity of potential output over the prime cost level [...] so if you have a supply curve which is valid over the short period only [...] you could only increase employment and output by increasing prime profit.' (Keynes 1973a: 368).

2 According to Moggridge's dating (Keynes 1973a: 380), this is the 'earliest' of the fragments of the 1931–2 period of writing. Moggridge's dating of the early *General Theory* fragments was questioned by Patinkin (see Patinkin 1993: 654–6). I do not see enough evidence supporting Patinkin's claims.

3 See also the letter to Hawtrey, 1 June 1932: 'I put less fundamental reliance on my conception of savings and substitute for it the conception of expenditure.' (Keynes 1973a: 172).

4 Keynes postponed the lectures he was to have held in the 1931 Michaelmas Term to April–May 1932 feeling that a 'theoretical clean up' was needed before he could 're-lecture stuff which is available in print'. Letter to Austin Robinson of 28 September 1931 (EAGR papers, Marshall Library, box 9).
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5 We have fragments from which he appeared to have lectured on 25 April and 2 May.
6 'I believe that [Keynes] thought then [in April 1932] and I think he thought later – of
the General Theory as supplementing rather than replacing the Treatise.' (E. A. G.
7 In 1980 Joan Robinson reviewed Vol. XXIX of the Collected Writings of J. M. Keynes,
where the Manifesto was first published. She argued that: '[...] Keynes, in his lectures,
was still using the cumbersome Treatise definitions, which turn on a difference
between saving and investment, but he was using them to get the same results'
(Robinson 1980: 391).
8 Of these lectures there survive fragments from 10 October and 14 November.
9 In retrospect Kahn was startled by this proposition: 'It is disconcerting in these
October [sic] lecture notes to read of the rate of interest “such as to cause saving to be
in excess of investment”.' (Kahn 1984: 113n).
10 In the retrospective evaluation of his “multiplier” article, Kahn wrote: ‘I was handicapped
having to translate my thinking into the definitions of the Treatise.’ (Kahn 1984: 100).
11 In fact, there is no evidence on whether the fragments corresponding to the first and
second 1933 draft table of contents (Keynes 1979: 63–75) were written during the summer,
but it is a plausible inference.
12 Dimand (1986) noticed that the Treatise profits are always ex post windfalls magnitudes,
except for one passage (Keynes 1930 [1971]: 143) in which they are considered as an ex ante measure of profitability.
13 By the autumn of that year he was using chapters 2–14 of the first drafts of the General
Theory for his lectures (Keynes 1973a: Rymes 1989).
14 My method there was to regard the current realised profit as determining the current
expectation of profit.

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